



PATENT SPECIFICATION

DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in Closures for Containers such as Bottles

We, AUSTRALIAN GLASS MANUFACTURERS COMPANY PROPRIETARY LIMITED, a Company incorporated under the laws of the State of Victoria, of Booker Street, Spotswood, in the State of Victoria, Commonwealth of Australia, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to closures for containers such as bottles and refers particularly, but is not limited, to bottle closures of the kind having an internally screw-threaded skirt for engagement with a screw thread formed externally on the bottle neck.

Such closures or screw caps are generally formed of metal, thermosetting plastic or other rigid material and in order to form a fluid-tight seal with the end of the bottle neck, it is usual to provide such caps with insert wads or discs formed of compressible material, and of recent years, such sealing wads have sometimes been formed of resilient plastic material, especially polythene.

Now the object of this invention is to provide improvements in closure caps—particularly screw caps and in sealing wads therefor.

Accordingly the invention includes a closure cap or cap sealing wad formed of polythene or other resilient liquid impervious material comprising a substantially plane disc forming the end wall of the cap or constituting the body of a wad adapted to be inserted within a cap, the said disc having its undersurface formed with a plurality of substantially concentric integral depending ribs arranged to engage the free end of a container neck to form a seal therewith, and characterised in that each of said ribs when viewed in cross section converges downwardly substantially to a point and has one of its sides disposed approximately parallel to the disc axis and its opposite side inclined at an acute angle thereto whereby the free lower ends of the ribs will tend to curl

in either wardly or outwardly when pressed against the container.

Preferably, the said sealing ribs are thin, shallow and closely spaced, whereby they are readily deformed to conform to the bottle neck and exert an adequate sealing pressure thereon.

Thus the seal is effected wholly or principally against the annular free end of the container neck outwardly of the mouth of the neck opening.

Any desired number of the said ribs may be provided and they could, if desired, extend more or less over the entire area of the underside of the disc, though only those ribs which are located in register with the annular free end of the container neck would be effective as sealing ribs.

Preferably, the said annular end of the neck is flat for a sufficient radial distance to provide an adequate sealing area, though this is not essential, because, for example, the said free end of the neck could be of rounded shape in cross-section, particularly if the coacting ribbed portion of the underside of the disc is correspondingly shaped.

When the pressure in the interior of the bottle exceeds the atmospheric pressure, the said ribs are arranged to curl inwardly, so that the internal pressure tends to force them outwardly and so enhance the sealing action and vice versa if the internal pressure is less than that of the atmosphere. In this regard, it will be apparent that the ribs tend to curl away from longer or more inclined sides of the ribs as the latter are viewed in cross-section.

When the invention is applied to a cap, the said ribbed disc forms the top thereof and is preferably formed with a depending cylindrical skirt which is screw-threaded internally or otherwise formed for retaining engagement with the exterior of the bottle neck.

If desired, a sealing wad according to the invention, may be provided with additional annular ribs on its upper face and with a peripheral wall or flange which projects

from either or both faces thereof.

The invention is hereinafter more fully described, with reference to the accompanying drawings in which:—

5 Figure 1 is a view in elevation of one form of closure cap according to the invention.

Figure 2 is a view in sectional elevation of a part of the cap and the coating portion of a bottle.

10 Figure 3 is a view similar to Figure 2 and shows the cap removed from the bottle.

Figure 4 is a view similar to Figure 2 and shows a modification, and,

15 Figure 5 is a view in sectional elevation of the wad shown in Figure 4.

The cap shown in Figures 1, 2 and 3 is formed of a suitable resilient material, e.g. polythene, and comprises a disc or top portion 10 having an integral depending skirt 12 formed with an internal screw thread 13. The inner surface of the top is formed with three concentric sealing ribs 14 so arranged as to engage the free outer end of the neck of a bottle or other container 16.

25 The dimensions of these ribs may be varied, though they are conveniently arranged about one thirty-second of an inch apart, while the thickness and depth thereof may each be about one sixty-fourth of an inch. More generally, the ribs are thin, shallow and closely spaced.

30 These annular ribs are of buttress or saw-tooth shape in cross-section with one of their peripheral surfaces disposed vertically (e.g. parallel to the cap axis) and with their other peripheral surfaces inclined at an angle of about 30° to the first-mentioned surfaces.

35 When the cap is screwed tightly onto the bottle neck, the annular ribs are deformed so that when viewed in cross-section, the tips thereof are curled towards the vertical sides thereof as shown in Figure 2. Thus, when the pressure within the container is greater than atmospheric pressure, the vertical sides are preferably the inner ones as shown in the Figure, so that the internal pressure within the bottle tends to straighten them and so increase the sealing action. However, if the cap is to be used for sealing under vacuum, the outer peripheral surfaces of the ribs are preferably vertical, while their inner surfaces are inclined in order that the tips of the ribs will tend to curl outwardly, instead of inwardly.

45 It will be understood that the dimensions may be varied considerably and also that the invention is applicable to sprinkler top bottles i.e. bottles of the kind having a perforated plug fixed within the neck as well as to bottles having the usual open neck.

60 A closure cap according to the invention is simple and convenient to manufacture and use and is comparatively inexpensive and effects a reliable seal without the use of an insert wad or disc which is apt to fall out when a cap is repeatedly used.

As above stated however, the invention also includes sealing wads having at least one face thereof formed with integral annular ribs and Figure 4 shows a cap 18 which may be formed of a thermosetting resin or other rigid material and which is provided internally with a moulded sealing wad or disc 19 formed of a suitable resilient compressible material such as polythene.

70 This sealing wad which is a neat fit within the cap comprises a flat disc provided on its upper and lower faces with concentric integral sealing ribs 20 as hereinbefore described and with upper and lower peripheral flanges 22. Thus as the two sides are identical, the wad may be inserted either way into the cap, while the ribs on the upper face provide increased resilience.

75 While, for the reason hereinbefore explained, the annular ribs are preferably of the illustrated saw-tooth or buttress shape in cross-section, the invention includes similar arranged sealing ribs of any suitable cross-sectional shapes.

WHAT WE CLAIM IS:—

90 1. A closure cap or cap sealing wad formed of polythene or other resilient liquid impervious material comprising a substantially plane disc forming the end wall of the cap or constituting the body of a wad adapted to be inserted within a cap, the said disc having its under-surface formed with a plurality of substantially concentric integral depending ribs arranged to engage the free end of a container neck to form a seal therewith, and characterised in that each of said ribs when viewed in cross-section converges downwardly substantially to a point and has one of its sides disposed approximately parallel to the disc axis and its opposite side inclined at an acute angle thereto whereby the free lower ends of the ribs will tend to curl either inwardly or outwardly when pressed against the container.

100 2. A closure cap formed of polythene or other resilient liquid impervious material comprising a substantially plane disc formed with a peripheral skirt and wherein the under-surface of the said disc is formed with a plurality of substantially concentric integral depending ribs arranged to engage the free outer end of the neck of a bottle or other container to form a seal therewith, said ribs being thin, shallow and closely spaced and characterised in that each of said ribs when viewed in cross-section converges downwardly substantially to a point and has one of its sides disposed approximately parallel to the cap axis and its opposite side inclined at an acute angle thereto whereby the free lower ends of the ribs will tend to curl either inwardly or outwardly when pressed against the container.

125 3. A sealing wad adapted for insertion in a closure cap, the said wad comprising a substantially plane disc of polythene formed on 130

at least one of its faces with a plurality of substantially concentric integral depending ribs arranged to engage the free end of the neck of a container to form a seal therewith, said ribs being thin, shallow and closely spaced and wherein each of said ribs when viewed in cross-section converges substantially to a point and has one of its sides disposed approximately parallel to the disc axis and its opposite side inclined at an acute angle thereto whereby the free lower ends of the ribs will tend to curl either inwardly or outwardly when pressed against the container.

4. A sealing wad according to claim 3 having a peripheral flange projecting from the same surface of the disc as the said annular ribs.

5. A sealing wad according to claim 4 wherein the two sides of the disc are substantially identical, whereby either side thereof may be directed downwardly within the cap.

6. A sealing wad for a closure cap substantially as hereinafter described with reference to Figures 4 and 5 of the accompanying drawings.

7. A closure cap substantially as hereinafter described with reference to Figures 2 and 3 of the accompanying drawings.

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COMPLETE SPECIFICATION

1 SHEET

This drawing is a reproduction of
the Original on a reduced scale

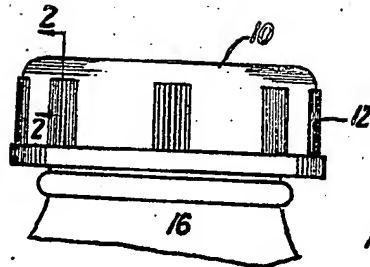


FIG 1

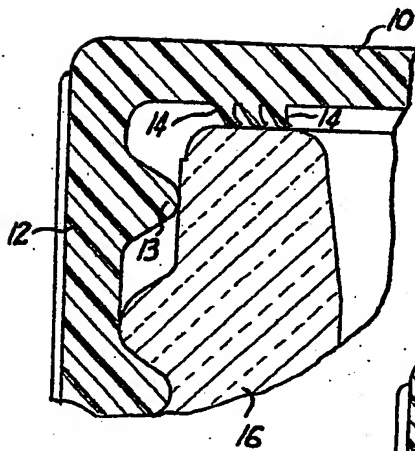


FIG 2

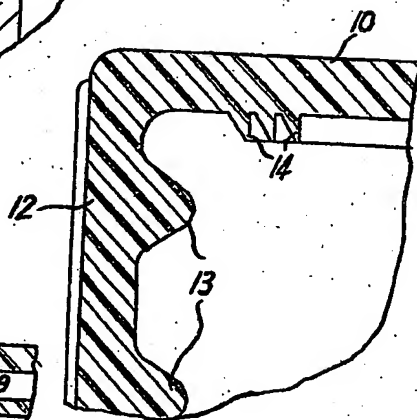


FIG 3

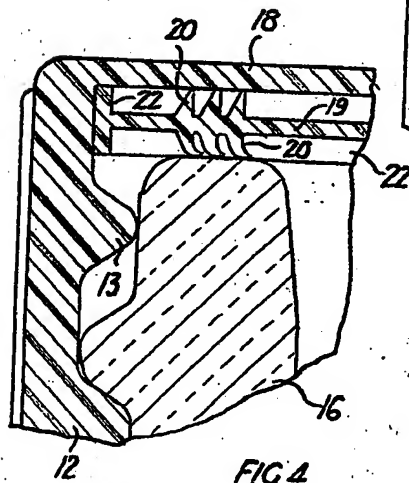


FIG 4

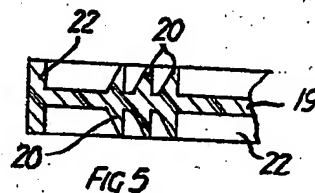


FIG 5